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DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
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November 13, 2003

Mr. Dan Ferriter
Atlantic Richfield Company
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SUBJECT: Agency comments to Response to Comments on the Draft Final Process Areas Work Plan for the Yerington Mine dated January 14, 2003

Dear Mr. McCarthy:

The Nevada Division of Environmental Protection (NDEP) has received and evaluated the **Response to Comments on the Draft Final Process Areas Work Plan for the Yerington Mine dated January 14, 2003** regarding the continued environmental investigation of the Yerington Mine, located in Lyon County near Yerington Nevada. This office provides the following comments from NDEP, EPA, BLM (Agencies) and other technical representatives of the Yerington Technical Work Group (YTWG).

There has been some progress towards addressing Agency concerns regarding document quality in these responses to comments provided on the Draft Final Process Areas Work Plan for the Yerington Mine Site, dated January 14, 2003. These responses to comments were provided as a result of the July 7, 2003 meeting held between Atlantic Richfield Company (ARC) and the Nevada Department of Environmental Protection (NDEP), U.S. Bureau of Land Management (BLM) and EPA, along with the comments previously provided by the regulatory agencies on July 9, 2003. As was agreed at the July 7, 2003 meeting a Final Process Areas Work Plan will be submitted for review 30 days after these review comments are submitted. Following review of that Work Plan the final approval determination will be made.

These review comments consist of general comments on the submitted document and specific review comments on (1) the Response to General Comments on the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003; (2) Response to Work Plan Specific Comments on the Draft

Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003; (3) Revised Table 1 Process Areas Sampling Schedule from the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003; and (4) proposed Process Areas groundwater Monitoring Plan.

General Comments:

Many of ARC's responses to the agencies comments indicate that the forthcoming final work plan will contain the necessary information that addresses the agency comments. The agencies anticipated that this information would be included in this recent submittal; however, we will make a final determination when the final work plan is submitted for our review.

One major issue to be corrected is in ARC's responses that indicate modifications to sub-surface sampling were agreed to by the agencies at the July 7 meeting. ARC indicates in their August 7, 2003 responses that at the July meeting, the agencies agreed to allow ARC to forgo all subsurface sampling and replace that sampling with the installation of a number of monitor wells. The agencies did not agree to this modification. At the July meeting, ARC's proposal was to install a number of monitor wells in lieu of investigating underground utilities. In order for this proposal to be accepted, ARC would have to include the appropriate rationale to support this proposal. The Agencies expect to see detailed subsurface sampling, including areas of suspected or known underground utilities, and supporting rationale for all components potentially sourcing CoCs in the Process Areas to be included in the final work plan. Without appropriate subsurface sampling and rationale, the work plan cannot be approved.

1. Location of Sub-Samples and Composite Samples - The use of sub samples and their composited needs to take into account the differing potential usage of an area and the distance between samples. The use of sub-samples needs to take into account possible variation in use of potential contaminants in a component area and if adequate historical justification is not available should take a conservative approach. Therefore proposing the collection of two sub-samples by one doorway and two sub-samples by a different doorway and then a fifth sample behind the building is not appropriate unless documentation is available to indicate the use of similar contaminants in all three areas.
2. Holding Times - Holding times need to taken into account when proposing to collect sub-samples and compositing them and only analyzing the sub-samples when an exceedance is seen. In some analytes such as metals such an approach may be viable but in the case of analytes such as VOCs does not seem appropriate.
3. Contamination in Interior of Structures - This proposed approach does not address contaminants inside of structures unless an obvious stained area or sump is encountered. How will this approach provide the information necessary to make the decision as to whether more data is needed to determine if this portion of the site is clean enough for closure?
4. Use of Composite Samples and Potential Dilution Effects - Comparison of soil samples to Region 9 Preliminary Remediation Goals (PRGs) is an appropriate approach when comparing discreet samples. Comparison of five point composites to PRG values will potentially result in missing contaminants at greater than 5X the PRG value due to the dilution of lower concentrations. How can an adequately protective approach be ensured?
5. Groundwater Monitoring Approach and Impacts - The use of groundwater monitoring

wells on the perimeter of the Process Components Areas may reduce the number of soil samples and reduce the uncertainty of unknown utilities however it does not take into account those potential sources that have not had adequate time to migrate to the perimeter of the areas or those that may not be mobile enough to have migrated such as PCB contaminated hydrocarbons from a leaking subsurface utility. Therefore this approach implies that some sort of institutional controls for the Process Area Components may always be required which would impact future land use.

6. Ambient Background Determination - EPA has repeatedly stated that background should be discussed thoroughly within one of the Yerington Technical Work Group meetings. We have also recommended that a range be used and that EPA's background sample, BK-1 (from EPA's 2/2001 sampling effort; please contact EPA if you do not have a copy of this report) be used as one location/value for background. If a sample exceeds a PRG or proposed background the agencies are still able to make site specific decisions regarding whether an area requires further definition. The determination of a technically justified and agreed upon ambient level for the contaminants at this site needs to be completed prior to any comparison of the data. The values from Schacklette and Boerngen (1984) as this reviewer understands them were derived for the conterminous U.S. and various subregions. Their applicability to the this site would need to be determined and justified.

1. General Comments the Response to General Comments on the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003

These comments on the Response to Comments follows the numbering format with corresponding comment titles used in Response to Comments (dated August 7, 2003) on the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003.

1. Page 2, Response to General Comment No.3: The forthcoming Final Process Areas Work Plan provide the requested justification and information, as discussed during the July 7, 2003 meeting.

The original comment noted that ARC must provide justification for the sampling methods, locations, and analytes at each potential source area along with historical and scientific justification for the proposed characterization. Although the revised Table 1 Process Area Sampling Schedule does provide an abbreviated rationale for sample locations and analyses, please note that final evaluation of the sufficiency of the response will be dependent on the requested justification and information in the forthcoming Final Process Areas Work Plan

2. Page 3, Response to General Comment No. 5: This response continues to indicate that composite samples will be submitted for VOC and TPH analysis. Again, as mentioned in previous comments, this is not the appropriate type of sampling and analysis for these particular CoCs. Archiving of sub-samples for potential future analyses will obviously depend on turn around times for analyses and specific holding times for certain CoCs, so ARC must consider potential re-sampling.

The 20 discrete "opportunistic" sample locations as proposed are confusing. For example, why are the locations and number of samples already indicated? And what is the significance of limiting the amount to 20? What is the rationale? What would happen if 20 "opportunistic" samples are taken and there are other areas that are suspicious in nature and are then identified as areas that require sampling, would they be sampled? If these samples were truly "opportunistic" then these samples could be taken where deemed necessary without any limitation.

As stated earlier, a number of monitor wells were to be proposed, along with the appropriate rationale, in lieu of sub-surface sampling of the utility lines only and were not intended to replace all subsurface sampling for all process areas components. Detailed subsurface soil sampling will have to be presented in the final work plan. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan. This BLM outline was included as an attachment to the July 9 NDEP letter.

What is the rationale behind the proposal that one out of twenty samples will be analyzed for radionuclides? Areas that have a high probability for contamination would be the areas where samples would be taken (subsurface as well). For example, would the Administration building be the one sample that is taken and sent to a lab for analysis? Would the Assay building be the one where no sample would be submitted for analysis? Would the calcine ditch be excluded as well because it is not the one in twenty? What if the sample that has been submitted for analysis comes back positive for radionuclides, would the area be re-sampled? Would the sample area be expanded? Would groundwater be included in the re-sampling? Based upon the historical information that we recently obtained, all samples, including groundwater samples, will need to be analyzed for radionuclides.

3. Page 3, Response to General Comment No.5: 1st Bullet; **Surface sampling will be conducted as follows for each point located on the revised figures: 1) Collect five sub-samples (each 0-12 inch depth); 2) composite equal weight portions of all five sub-samples into one composite sample to be submitted for one or more specific analyses (e.g. whole rock, VOCs, TPH) per the revised Table 1; and 3) each of the sub-samples will be archived for potential future analyses dependent upon the results. In addition,...**

How will this proposed approach take into account those analytes such as VOCs that have a relatively short holding time of 14 days following sampling? And how will the regulatory agencies be involved in such decision making activities? There should also be a potential for further sampling at depth based upon the results of the archived samples.

4. Page 3, Response to General Comment No.5: 4th Bullet; **Analytical trigger levels based upon the EPA Region 9 Preliminary Remediation Goals (PRGs) or some other appropriate screening level will be presented in the forthcoming Work Plan for potential COCs in soils. The analytical trigger levels will be used to evaluate whether the sub-samples archived from the sampling activities should be submitted for laboratory analysis.**

Since the selection of appropriate screening levels is a significant component of such a screening level approach, the proposal of alternate screening levels will need to be adequately documented and justified. When using a sampling approach which relies on the use of composite sampling and the use of perimeter monitoring wells to evaluate migration from potential subsurface source areas rather than subsurface sampling as proposed, the need for appropriate screening levels is critical and key to approval of the work plan.

5. Page 4, Response to General Comment No.5: Bullet 6; **In lieu of ... Based upon the results of the groundwater monitoring and surface soils sampling, the need for sub-surface soils sampling will be evaluated based upon risk.**

How will such an evaluation be made regarding the need for sub-surface soils sampling based on risk be conducted if there is not adequate data collected to sufficiently characterize the site or to conduct a baseline risk assessment? The use of risk based screening level criteria such as PRGs is appropriate but even that approach will need to meet the statistical and data requirements of any risk based approach.

6. Page 4, Response to General Comment No.5: Bullet 7; **Radionuclides (gross alpha, beta and uranium) in Process Areas soils will be analyzed at a frequency of one out of 20 samples shipped to the laboratory for whole-rock analysis. Collected samples will be screened for gamma radiation with a scintillation detector (e.g. Victoreen model 450B Ion Chamber Survey Meter) and samples with the highest reading will be analyzed for gross alpha, beta and uranium. If possible, the samples selected for radionuclide will be distributed geographically throughout the Process Areas.**

Based on the new information indicating potentially widespread uranium mineralization at the site, of sufficient quantity to consider the economic feasibility of uranium production in 1976, the proposed approach is inadequate to address the radiological contaminants at the site. Attempting to narrow the scope of investigation before better understanding the distribution and variability could result in missing hot spots. Therefore, all of the samples collected both soils, surface water and groundwater should be screened with appropriate radiological investigative approaches.

Such approaches at a minimum should consist of gamma ray screening of soil samples with confirmation sampling of anomalous samples (anomalous samples would be those exhibiting values 2X site specific background or a similar statistical approach). Also a statistically significant percentage of the total samples will need to be submitted for confirmation analyses. Groundwater samples should be analyzed using Total Uranium, Radium 226 and Radium 228.

A key factor in evaluating any potential risk will be to determine any incremental risk above that from the site specific ambient levels. The determination of ambient levels will need to take into account the geographical distribution as well as the difference in specific soil and rock types and needs to be considered when characterizing distribution of radiological contaminants.

7. Page 4, Response to General Comment No 6: BLM's previous comments and suggestions for this work plan need to be addressed by ARC in the final work plan.

8. Page 4, Response to General Comment No.7: **All specific locations of revisions cannot be referenced in this response to comments letter since it is being submitted prior to the revised Work Plan. Atlantic Richfield suggests that a redline-strikeout version of the forthcoming Work Plan may be useful in reviewing document revisions, and can be provided upon request.**

While the point made in regards to this response to comments letter and the forthcoming Work Plan may be appropriate for this atypical situation, nonetheless in other documents, please include the location or locations of all revisions to speed the review process. To avoid unanticipated delays in particular those resulting from poor quality documents such a simple approach is an efficient way to expedite the process.

9. Page 5, Response to General Comment No.8: **The forthcoming Process Areas Work Plan will be revised to reflect that, as part of the proposed field investigations, Atlantic Richfield will evaluate the risk posed by the possible existence of the transfer points through surface soil sampling and laboratory analyses that will be conducted at these locations pending field observations. Furthermore, the groundwater data to be collected as part of the monitoring well installation and monitoring program associated with the Process Areas will provide additional information on the risk posed by the transfer points.**

Does the decision point of field observations refer only to soil discoloration or positive identification of location also? How will the risk be evaluated unless the data collected consists of statistically significant

sampling and data quality or is the determination to be qualitative? In particular how are disparate data sets which would document disparate exposure pathways to be reconciled in such an approach?

10. Page 5, Response to General Comment No. 10; **Radionuclides (gross alpha,,beta and uranium) in Process Areas soils will be analyzed at a frequency of one out of 20 samples shipped to the laboratory for whole-rock analysis. Collected samples will be screened for gamma radiation with a scintillation detector (e.g. Victoreen model 450B Ion Chamber Survey Meter) and samples with the highest reading will be analyzed for gross alpha, beta and uranium. If possible, the samples selected for radionuclides will be distributed geographically throughout the Process Areas.**

Please see comment on General Comment No.5, Bullet No.7 above.

11. Page 6, Response to General Comment No. 12: **Atlantic Richfield is confident that all exposure pathways associated with the Process Areas will be evaluated based on the data collected from the field investigation described in the revised Work Plan, in conjunction with the data to be collected under the other Work Plans for the site.**

The response still does not address the need to ensure that the data collected as part of the investigations will be sufficient to complete risk screening and a risk assessment if necessary .In particular since the Work Plan proposes the need for sub surface soil sampling based on risk along with the evaluation of the risk at transfer points. The use of composite sampling may have significant impact on the determination of risk and its' justification. Finally since all of the Work Plans will require significant revision due to document quality issues it does not seem justified to assume that the data collected under the other work plans will be anything other than supplemental.

12. Page 7, Response to General Comment No. 13: 2nd Paragraph; **With respect to records research and employee interviews, Atlantic Richfield has thoroughly inspected all files and records at the mine site and applicable publications available at the Mackay School of Mines library. In addition, Atlantic Richfield is researching the archived Anaconda records at the University of Wyoming in Laramie, Wyoming for relevant information..**

As stated above significant new information has been provided by BLM's archival research Which indicates potentially widespread uranium mineralization at the site, sufficient to consider the economic feasibility of uranium production in 1976. Such a discovery further supports the need to better evaluate historical information. Additional sources of information potentially exists in the geologic literature outside of the Mackay School of Mines Library and needs to be thoroughly evaluated. Particularly significant will be any information regarding the nature of the occurrence of uranium mineralization; whether it was widespread and disseminated or more concentrated as in vein deposits. The situation indicates that Atlantic Richfield's current research will need to be much more comprehensive than past efforts.

13. Page 7, Response to General Comment No.14; Last two sentences: **Based upon the results of the groundwater monitoring and surface soils sampling, the need for sub-surface soils sampling will be evaluated based upon risk. Should sub-surface sampling be deemed necessary upon review of the collected groundwater data, Atlantic Richfield will work with the regulatory agencies to develop a discrete sub-surface sampling protocol.**

Please see comment on Response to General Comment No.5, bullet no.6 above. Also will review of the collected groundwater data be after one round of groundwater sampling or after four quarters of sampling? The need for discrete sub-surface sampling should be evaluated as

soon as possible to allow adequate site characterization and determine any risk. As stated earlier, sub-surface sampling will have to be presented in the final work plan. See comment 1) above.

14. Page 8, Response to general Comment No. 15; **The January 14, 2003 Draft Final Process Areas Work Plan described on page 21 how inspection of pipes exiting buildings would be conducted. However the Response to General Comment No. 14 now applies to the investigation of these pipes. Based on historical photographs and maps, Atlantic Richfield has provided the best approximation of the trench alignment on Figure 4. The revised Work Plan will expand on the historical calcine ditch. Sample locations are proposed at the beginning of the ditch (i.e. the former acid plant), and at the end of the ditch. If either location indicates anomalous contamination, the individual sub-samples will be analyzed to help delineate the lateral and if required, vertical extent of impacted soils. Then need for any additional sampling will be determined upon the evaluation of the data.**

Based on the description of the calcine ditch as being an unlined surface feature that conveyed calcine solutions along with spent solutions from the copper leaching process the potential for contamination from this feature is significant. Along such a linear feature the use of clustered composite samples as proposed appears to be inadequate and could potential miss areas of leakage along the feature. A more appropriate approach would one similar to the one proposed along the vat leach tanks with sampling along the entire length of the approximated ditch alignment. In particular sampling should be conducted at any locations with a change in alignment or construction of the ditch could create impoundments, overflow or low flow conditions.

The proposed investigation of the "calcine" ditch needs to incorporate, at a minimum, the entire length of the ditch including both lateral and vertical sampling. See comment 1) above

BLM's previous comments and suggestions for this work plan need to be addressed by ARC in the final work plan.

15. Page 9, Response to General Comment No. 18 : **The revised figures in the Work Plan will also provide more clarity.**

ARC's response on page 9 seems to indicate that the line drawing for each building will be included, however, on page 16, first paragraph, seems to indicate that these will not be done. What is actually planned?

2. Work Plan Specific Comments the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003

16. Page 12, Response to Specific Comment No. 5; 4th paragraph after Step 7 bullet: **Analytical results from composited soil samples will be compared to analytical trigger levels for metals to determine if composited sub-samples should be subject to individual analyses. The proposed analytical trigger levels for soils analyses include the following EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial sites. Note that the arsenic industrial PRG will be replaced with the higher values of a the range of background values for the Yerington areas collected by Schacklette and Boerngen (1984). Also note that EPA issued a Record of Decision on Community**

Soils at the Anaconda Smelter NPL Site in Anaconda, Montana in September 1996. The risk-based clean-up levels for arsenic at this site were 250, mg/kg for residential, 500 mg/kg for commercial/industrial and 1,000 mg/kg for recreational use.

The Agencies agree that the use of Region 9 PRGs as a screening level criteria is an appropriate approach and appreciates ARC's willingness to consider them in conjunction with any other appropriate screening level criteria. Also the note of the use of higher risk based clean-up levels as described for the Anaconda Smelter NPL site further supports the need to ensure that adequate data is collected of sufficient quality to perform a site specific risk assessment necessary to determine appropriate risk based clean-up levels. Keeping this in mind, how will the use of composite samples when screened against PRGs accomplish this? The use of 5 sub-samples in a composite could potentially result in the composited sample value below a PRG even though some samples could exceed the PRG criteria but would be offset by the remaining non-detect values? Also in the case of those analytes with a very short holding time such as VOCs, with 14 days, how would the process of first screening the composite sample against a PRG allow the holding time requirements to be met?

The issue raised in the comment illustrates the need for the Yerington Technical Work Group to address the need to establish ambient levels as has been previously noted. We have recommended that a background range be used and that EPA's background sample, BK-1 (from EPA's 2/2001 sampling effort; please contact EPA if you do not have a copy of this report) be used as one location/value for background. If a sample exceeds a PRG or proposed background the agencies are still able to make site specific decisions regarding whether an area requires further definition. The determination of a technically justified and agreed upon ambient level for the contaminants at this site needs to be completed prior to any comparison of the data. The values from Schacklette and Boerngen (1984) were derived for the conterminous U.S. and various subregions. Their applicability to this site would need to be determined and justified, therefore the substitution of the upper range value for arsenic would be premature at this time.

17. Page 15, Response to Specific Comment No. 7; 3rd paragraph: **Soil samples to be collected from locations that may be representative of background conditions are identified in associated Work Plans (Waste Rock Areas, Evaporation Ponds and Tailings Areas, Arimetco Heap Leach and Process Components and Cover Materials).**

As note in the comment above the determination of agreed upon and technically justified ambient levels of potential contaminants is a critical component to the investigation and cleanup at this site which has not been addressed. In particular the use of the fragmented and uncoordinated approach suggested is not appropriate, and should be replaced with a sound, integrated and technically justified process.

20. Page 23, Response to Specific Comment No. 10, Comments on Tables, sub comment j: **Atlantic Richfield proposes to evaluate the removal of tank contents and tank removal using the data from the field investigations described in the revised Process Areas Work Plan, and plan to mitigate the tanks will be presented to the regulatory agencies.**

Based on the incomplete operational history of the site how will the collection of the composite soil samples provide adequate information for addressing the tank contents and removal at this site? It would appear that more specific sampling would be necessary to address any potential contamination remaining or associated with the tanks.

3. Comments on Revised Table 1 Process Areas Sampling Schedule from the Draft Final Process Area Work Plan for the Yerington Mine Site dated January 14, 2003;

Table 1, Process Areas Sampling Schedule: The following are a few examples of the inadequacies of the proposed sampling scheme and rationale. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan.

Assay Laboratory: The five sub-samples proposed for this building are collected over a lineal distance of 250 feet and over an unknown surface area. One problem with this sampling scheme is that the five samples are being collected over too large an area. What is the basis for this proposal? One acceptable method for characterizing the soils around the assay lab is to first establish an appropriate sampling grid across the areas of interest (service doors, loading dock areas). Both surface and subsurface soil samples are collected at the grid points and composited based on the type of analyses for CoCs including radionuclides (VOCs, SVOCs are collected as discrete samples). Obviously, based on this sampling scheme, more than one sample will be submitted for analysis.

Leach Vats: It is stated that *"The robust construction of the vat walls and floors makes it unlikely that cracks ever developed completely through the structure. The interior of the vats will be inspected for such cracks, however, and if any are observed, these will be recorded and inspected."* How will cracks in the concrete be inspected? This facility covers an area of over 155,000 sq. ft and yet only 4 samples will be submitted for analysis. The sampling scheme is not supported by rationale. Sub-surface sampling needs to be included as well and radionuclides also need to be included as a CoC.

Filling Station #3: The description of this facility indicates a possible UST exists, yet only five surface sub-samples are proposed to be collected and composited into one sample. A sub-surface investigation at this facility needs to be proposed. Based upon the submitted figures, why weren't monitor wells proposed for underground utilities in this as well as other areas?

24. Sampling approach proposed relies on the collection of a minimum of 5 sub-samples to be composited into one composite sample for each component. In most of the components called out in table the five sub-samples include sub-samples from different areas of a component such as a building like the Assay Laboratory. At this component five sub-samples would be collected and composited, including two each from in front of both sets of overhead service doors and one from the loading dock along the northwest side. Since detailed historical information and operational histories are not available, what is the justification for the compositing of the sub-samples from potentially differing usage areas with potentially differing contaminants? Also in those instances where the holding times for an analyte is short, such as VOCs, how will the process of evaluating the composite sample prior to conducting analysis of the individual sub-sample be handled to avoid missing a holding time criteria?

Specific Comments:

25. **Specific Comment No. 5:** The Proposed Analytical Trigger Levels need to include radionuclides.

26. Component: Administration Building; Rationale reads: **The area where the former fuel island is believed to have been located (Figure 4A) is approximately 40 feet by 40 feet. Therefore, five sub-samples will be collected and composited from within this area, and analyzed for TPH (GRO and DRO).**

What is the basis for the area delineated as being 40 by 40 feet and is the proposed sampling using five clustered sub-samples the most effective sampling approach versus transects?

27. Component: Change House: Rationale reads: **A small room at the north end of the building was a former laboratory. No chemicals are present in the lab, No solvents were stored there. There is no reason to believe that any potential contaminants other than those associated with the laboratory (e.g. small amounts of acids and inorganic lab chemicals) would be present at this location.**

Unless a detailed operational history of the chemicals used in the laboratory is available the analytes should include VOCs and SVOCs. Also the sampling notes that two of the samples would be collected in front of the doorway and three outside of the building. Does this mean that the two in the building would be of the flooring material which is not described and three would be soil samples? How comparable would this data be?

28. Component: Assay Laboratory: Rationale reads: **Therefore, analyses will be for ABA, WRA, VOC, TPH, (DRO) and PCB.**

Based on the description provided in the rationale, deleting an analysis of SVOCs is not justified unless a detailed operational history for the building is available.

29. Component Carpenter Shop: Rationale reads: **A small concrete sump with a valve is present outside the west wall of the building. There is no indication that the building was ever used for other activities other than for carpentry work, thus is no reason to believe that any potential contaminants of concern were ever used or stored in the shop.**

The presence of a small concrete sump potentially invalidates the argument that only simple carpentry was involved. Unless a more detailed operational history is available sampling needs to be evaluated.

30. Component: Sheet Metal Shop: Rationale reads; **There is no indication that the building was use for any purpose other than as a sheet metal shop. Therefore, analyses will be for TPH (DRO).**

In most sheet metal shops solvents would be used to clean metal surfaces, acids to pickle a surface for preparation, and welding operations that could use welding rods could take place. Therefore unless a more detailed operational history is available the analytes should include metals, VOCs and SVOCs, along with the called out TPH.

31. Component: Motor Cargo Building: Rationale reads: **Since Weed Heights is currently conducting operations in and around the building, any laboratory analytical results from samples collected at this component could be potentially representative of activities conducted by Weed Heights personnel or equipment.** (No sampling is proposed based on this assumption?)

The purpose of the investigation to is determine potential releases to the environment rather than attribution of the responsible party for a particular source. Since the component was used by ARC in the past the activities, potential contamination need to be assessed even if the attribution is uncertain. Therefore sampling of the component is necessary.

32. Component: Former Calcine Ditch: Rationale reads: **Therefore, sub-samples will be collected and composited near the source at the Acid plant and also approximately 3,400 downstream along the ditch.**

Such a compositing approach for a long linear feature such as the unlined Calcine Ditch is not appropriate for sampling. An approach similar to that used for the vat leach tanks would be more appropriate.

33. Component: Surface Pumps Foundation: Rationale reads: **The potential contaminants of concern near this structure are sulfuric acid and metals associated with surface runoff over tailings.**

The proposed analytes do not take into account the potential use of lubricants for the pumps or diesel units to power the pumps. The analyte list should be expanded to add TPH (DRO).

4. Comments on Proposed Process Areas Groundwater Monitoring Plan.

General Comments

34. As EPA has stated in comments to the Groundwater Conditions Work Plan, conducting monitoring activities on a quarterly basis for a period of only one year will not provide sufficient data to characterize temporal and spatial trends in groundwater flow directions and COC fate and transport. A longer monitoring time frame is recommended.

35. Once the initial groundwater flow and water quality data have been collected and evaluated, “hydropunch” or “vertical profiling” technologies could be used to further delineate potential contaminant plumes and help identify which groundwater zones to monitor with wells. This may help limit the number of new monitoring wells required.

36. The Agencies agree with the approach to install three monitoring wells initially to determine groundwater flow direction, however, given the lack of groundwater data in this area it may be difficult to target appropriate groundwater zones without some use of hydropunch or vertical profiling technologies. Also, the exact number of wells should be determined by the data requirements. For example, it is very likely that more than one groundwater zone will require monitoring. Also, how will ARC monitor the southwestern boundary of the Process Area? This appears to be a data gap, given the Megapond to the SW as well as the old processing plant (now covered by the heap leach). Also given the size of the Process Components Areas more than one monitoring well such as PAMW-6 may be required. What is the basis for the assumed sizes of potential plumes justifying the spacing used for the monitoring wells on the perimeter of the area?

37. Due to the location of the Process Areas Components in the central portion of the mine operations, with surrounding and adjacent mining operations, how will the potential contamination from contaminant sources in these other areas be taken into consideration? The proposed monitoring well PAMW-1 lies down gradient from Arimetco’s Electro Winning Processing area. Wouldn’t this make it difficult to determine an appropriate background level?

38. Figure 1, minor comment: The old processing plant, SS, is not identified in the key for Figure 1.

39. **Process Areas Groundwater Monitoring Plan:** ARC’s proposed groundwater monitoring plan for the process areas is insufficient to monitor the entire process areas. For example, the proposed first phase of the groundwater monitoring plan includes the installation of three wells (PAMW -1, -2 and -3) that will be used to establish the hydraulic gradient as well as provide geochemical characterization of the alluvial groundwater up- and down-gradient of the process areas. What appears to be indicated is that these wells will be constructed across the first encountered aquifer. Is this true? Is there information that indicates that only one aquifer should be monitored? In the past ARC has insisted that there is more than one aquifer and that contamination is contained within the first aquifer. If the aquifer is in a fluvial depositional setting, then how can these three wells determine whether there is contamination below the

first aquifer? Doesn't it seem probable that more than three wells will be necessary to monitor aquifers below the first?

Proposed monitor wells PAMW -2, -3 and -4 are spaced approximately 800 and 1,000 ft apart from each other, so how can they determine whether filling stations #1, #2 and #3 (Facility ID# U, X, W), located approximately 2,000 ft up-gradient from these three wells has sourced CoCs to groundwater? Dilution and the preferential groundwater pathway of CoCs must certainly be involved when such large distances from monitoring are proposed. Also, the proposed 1-yr monitoring of these wells is not supported. Some CoCs may not be as mobile as others, so it will take longer for these CoCs to impact groundwater. Based upon the submitted figures, why aren't the proposed monitor wells located closer to the actual underground utilities such as fuel lines, spent and acid lines that were known to carry CoCs?

The Agencies agree with ARC that the groundwater monitoring proposal should be integrated with the site-wide groundwater evaluation anticipated by the Groundwater Conditions Work Plan. Again, a number of monitor wells were to be proposed, along with the appropriate rationale, in lieu of sub-surface sampling of the utility lines only and were not intended to replace all subsurface sampling for all process areas components. Detailed subsurface soil sampling will have to be presented in the final work plan. Please refer to the "BLM Sample of Yerington Mine Process Areas Work Plan Outline, April 14, 2003" for examples of the type of sampling information to be included in the final work plan.

Accordingly, please provide the Final Process Areas Work Plan that incorporates the above comments. This information must be received not later than December 13, 2003 per agreed upon submittal schedule.

Should you have any questions or if I can be of any assistance, please do not hesitate to contact me at (775) 687-9376 or FAX (775) 687-6396. All future correspondence regarding this subject should be addressed to the undersigned.

Sincerely,



Arthur G. Gravenstein, P.E.
Staff Engineer
Remediation Branch
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